Data Brief
Injuries Among Massachusetts Residents, 2012

Massachusetts Department of Public Health | December 2015

Injuries are a Major Public Health Problem in Massachusetts

Injuries are the *third* leading cause of death among Massachusetts residents and the *leading* cause of death among Massachusetts residents ages 1 to 44. In 2012, 3,013 Massachusetts residents died as a result of unintentional, self-inflicted or assault-related injuries (41.7 per 100,000[1]). In addition, there were 74,539 hospital stays (1,015.3 per 100,000) and 714,414 emergency department (ED) visits (10,967.1 per 100,000) among MA residents associated with nonfatal injuries. (Figure 1) These figures do not include injuries which were only treated at home or in a physician's office.

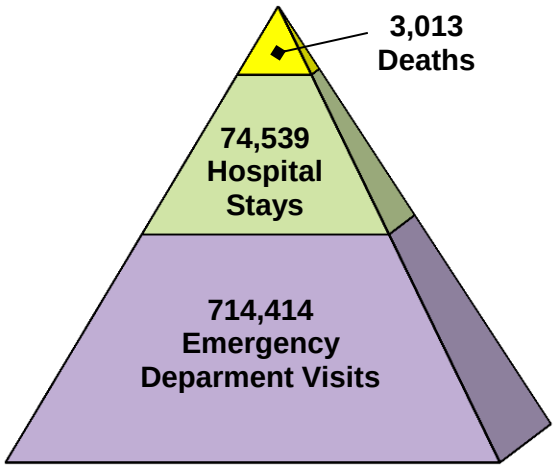


Figure 1. Total Burden of Injuries, MA Residents, 2012[2]

What do we mean by "*injury*"?

Injuries are bodily harm – fatal or nonfatal - that can be caused by fires, car crashes, drowning, sharp objects, guns, poisoning, being struck by something, tripping on the sidewalk, pedestrian injuries and more. Injuries may be unintentional (sometimes referred to as "accidental"), self-related harm or assault-related.

Report Contents

This report describes injuries to MA residents in 2012 that resulted in death or required treatment at a MA acute care hospital. Sections include:

- **Leading Causes of Injury Death and Hospital Stays**
- **Fatal and Nonfatal Injury Rates**
- **Injury Rates by Sex**
- **Injury Prevention in Massachusetts**
- **Injury Prevention Resources**

Key Findings

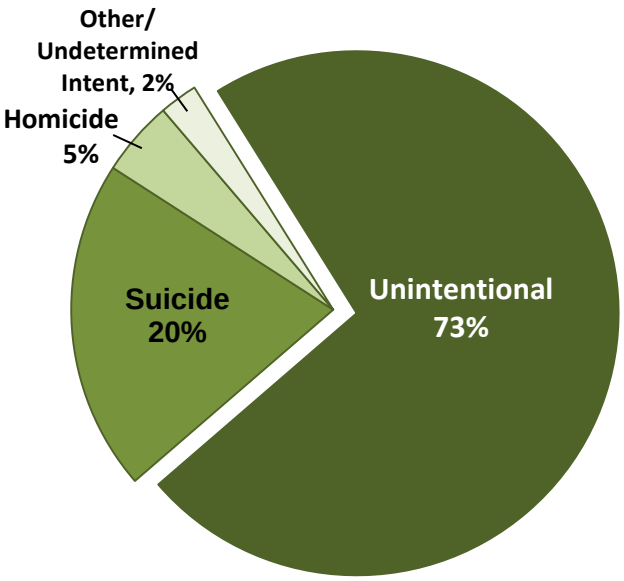
Among MA residents in 2012:

- Unintentional injuries accounted for the majority (73%) of the 3,013 injury deaths.
- Of the 2,186 unintentional injury deaths of MA residents, the three leading causes were poisoning/overdoses (37%), falls (29%) and motor vehicle (MV) traffic-related injuries (16%).
- Falls among MA adults ages 65 and over accounted for one-quarter (24%) of unintentional injury deaths.
- Over one in four injury deaths (28%) involved a traumatic brain injury.
- Compared to females, death rates for males were 2x higher for unintentional injuries, 3x higher for suicide and nearly 4x higher for homicide.

1. All rates are age-adjusted rates per 100,000 MA residents unless otherwise specified.
2. The MA Department of Public Health recently modified its method of identifying injury cases to align more closely with national standards. Therefore data from this report should not be compared with previous reports. See notes on page 6 for complete injury definitions.

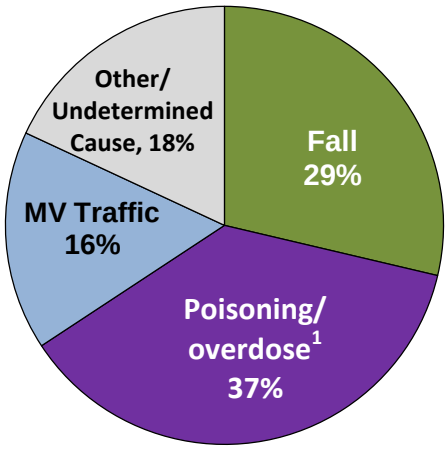
Injuries Among Massachusetts Residents, 2012

Leading Causes of Injury Death



Injury Deaths by Intent
(n = 3,013)

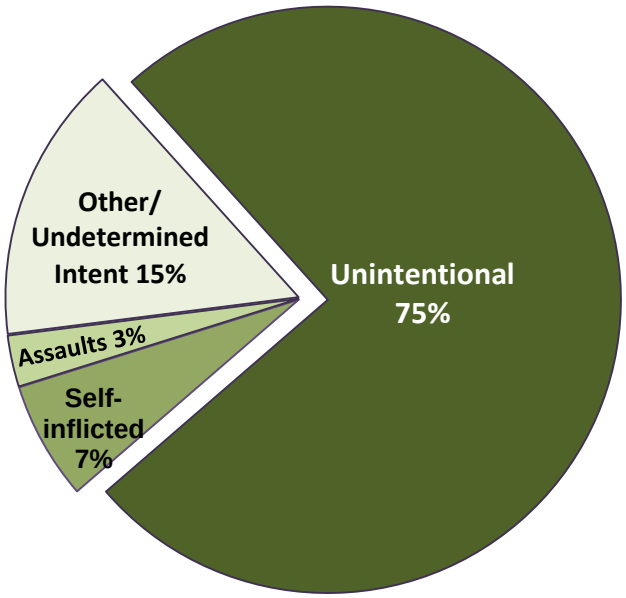
- Unintentional injuries accounted for the majority (73%) of the 3,013 injury deaths of MA residents in 2012.



Unintentional Injury Deaths by Cause
(n = 2,186)

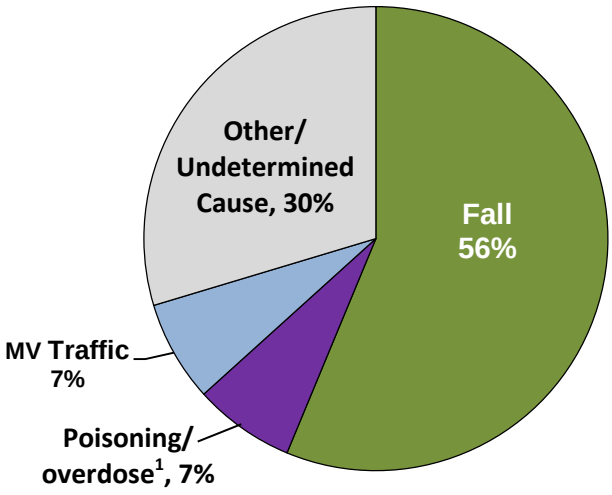
- The leading causes of the 2,186 unintentional injury deaths among MA residents in 2012 were poisoning/overdoses[1] (37%), falls (29%) and motor vehicle (MV) traffic-related injuries (16%).

Leading Causes of Injury-related Hospital Stays



Injury-related Hospital Stays by Intent
(n = 74,539)

- Unintentional injuries accounted for three out of four (75%) of the 74,539 injury-related hospital stays of MA residents in 2012.



Unintentional Injury Hospital Stays by Cause
(n = 56,142)

- Falls accounted for over half (56%) of hospital stays for unintentional injury in 2012. Of these 31,585 fall-related hospital stays, two-thirds (69%) involved MA adults ages 65 and older. (Data not shown.)

1. Unintentional poisonings only. Figures will differ from those that combine poisonings of unintentional and undetermined intent.

Fatal and Nonfatal Injury Overview

Among MA residents in 2012,

- There were a total of 3,013 injury deaths, as well as 74,539 hospital stays and 714,414 ED visits for nonfatal injuries.
- Unintentional injuries accounted for 73% of injury deaths, 75% of injury hospital stays and 92% of injury ED visits.
- Over one in four injury deaths (28%) and one in ten injury-related hospital stays (11%) involved a traumatic brain injury.
- Falls among MA adults ages 65 and over accounted for one-quarter (24%) of unintentional injury deaths and over one-third (39%) of hospital stays for unintentional injury.

Table 1. Fatal and Nonfatal Injuries among MA Residents, 2012

	Deaths		Nonfatal Hospital Stays		Nonfatal ED Visits	
	All rates are age-adjusted per 100,000 MA residents					
	Number	Rate	Number	Rate	Number	Rate
TOTAL INJURIES	**3,013**	**41.7**	**74,539**	**1,015.3**	**714,414**	**10,967.1**
Selected Injuries (regardless of intent; categories may overlap with those below)						
Traumatic Brain Injury	836	11.3	8,031	110.4	63,932	979.4
Poisoning/overdoses[2]	963	14.2	8,664	127.0	17,260	267.0
Firearms	235	3.4	283	4.3	349	5.3
Unintentional	**2,186**	**29.8**	**56,142**	**753.6**	**656,686**	**10,081.4**
Fall-related	627	7.6	31,585	406.5	180,802	2,721.8
Falls among persons 65+	533	50.0	21,721	2,125.1	43,694	4,404.0
Motor vehicle traffic-related	354	5.1	3,957	57.5	72,248	1,095.7
Motor vehicle occupant[3]	203	2.9	2,567	37.1	64,773	982.7
Motorcyclist	59	0.9	557	8.1	2,401	36.0
Pedestrian[4]	85	1.2	707	10.3	3,893	59.0
Pedal Cyclist[4]	19	0.3[1]	752	11.0	8,801	140.3
Drowning/submersion	40	0.6	44	0.7	152	2.5
Fire/burn	23	0.3	656	9.8	9,298	144.9
Suicide/self-inflicted	**616**	**8.8**	**4,853**	**73.1**	**6,459**	**99.4**
Homicide/assault	**140**	**2.1**	**2,112**	**32.1**	**25,952**	**398.7**

1. Rates based on counts of less than 20 may be unstable.
2. Includes poisonings of all intents, therefore counts and rates may differ from poisoning data in other DPH reports.
3. Includes drivers, passengers and unspecified persons.
4. Due to motor vehicle or other causes.

Injury Rates by Sex

- Males have higher injury rates than females for most types of injuries. Among MA residents in 2012, death rates for males compared to females were:
  - 2x higher for unintentional injury deaths (41.0 vs. 19.8 per 100,000)
  - 3x higher for suicide (13.8 vs. 4.2 per 100,000) and
  - Nearly 4x higher for homicide (3.3 vs. 0.9 per 100,000).
- The greatest differences in injury rates by sex were for firearm injuries (all intents). Compared to females, male injury rates were 8x higher for firearm deaths (6.3 vs. 0.8 per 100,000) and 11x higher for firearm-related hospital stays (8.0 vs. 0.7 per 100,000).
- Males also had higher rates of fatal and nonfatal traumatic brain injury, motorcyclist and pedal cyclist injuries than females.

Table 2. Injuries to MA Residents by Sex, 2012

	Deaths		Nonfatal Hospital Stays		Nonfatal ED Visits	
	All rates are age-adjusted per 100,000 MA residents					
	Males (n=1,955)	Females (n=1,057)	Males (n=35,738)	Females (n=38,801)	Males (n=381,537)	Females (n=332,870)
TOTAL INJURIES	59.5	25.6	1,094.0	923.9	12,082.1	10,074.8
Selected Injuries (regardless of intent; categories may overlap with those below)						
Traumatic Brain Injury	17.5	6.1	137.7	84.6	1,093.8	860.1
Poisoning/overdoses[2]	19.5	9.1	125.2	129.0	282.8	251.8
Firearms	6.3	0.8	8.0	0.7	9.5	1.2
Unintentional	41.0	19.8	796.3	695.2	11,041.6	9,098.7
Fall-related	9.4	6.3	370.2	422.7	2,651.9	2,753.0
Falls among persons 65+	61.2	43.3	1,701.3	2,389.4	3,615.0	4,966.1
Motor vehicle traffic-related	7.7	2.7	72.3	43.2	1,038.7	1,152.4
Motor vehicle occupant[3]	4.4	1.5	42.2	32.2	877.2	1,086.6
Motorcyclist	1.6	0.2[1]	14.7	1.8	62.4	10.3
Pedestrian[4]	1.6	0.9	11.9	8.9	70.1	48.2
Pedal Cyclist[4]	0.4[1]	0.1[1]	17.8	4.5	211.6	69.6
Drowning/submersion	1.0	0.2[1]	1.0	0.5[1]	2.6	2.5
Fire/burn	0.3[1]	0.3[1]	12.6	7.2	148.7	140.8
Suicide/self-inflicted	13.8	4.2	65.6	80.7	82.9	116.0
Homicide/assault	3.3	0.9	50.3	14.3	492.8	306.6

1. Rate is based on a count of less than 20 and may be unstable.
2. Includes poisonings of all intents, therefore counts and rates may differ from poisoning data in other DPH reports.
3. Includes drivers, passengers and unspecified persons.
4. Due to motor vehicle or other causes.

Injury Prevention in Massachusetts

While we have made tremendous progress in the field of injury prevention over the past several decades, this report highlights that there is still work to be done. Injuries are largely preventable events. The public health approach to preventing injury is similar to that for preventing disease. Injuries are not simply "acts of fate". The Massachusetts Department of Public Health's (MDPH) Division of Violence and Injury Prevention works closely with our internal partners, other state agencies and external institutions and organizations to advance practices and policies that both protect Massachusetts residents from injury and reduce injury severity. One approach to violence and injury prevention utilizes a framework is sometimes referred to as "the four E's" of injury prevention. These include:

- *Environmental Design and Engineering:* Adoption of safer products and environmental designs can greatly reduce one's risk of injury.
- *Enactment and Enforcement of Policies:* Laws, regulations and institutional polices can promote safe behaviors or responses and prevent injury.
- *Education:* Educating the public and professionals can change behaviors and reduce injuries.
- *Emergency Medical Services:* Ensuring a high quality trauma management system so that individuals who are injured are transported to facilities with the most appropriate care in order to reduce deaths and improve outcomes after an injury.

The data described in this bulletin provides useful information for identifying the reasons people are injured and the populations where the greatest burden of injury lies in Massachusetts. Through a concerted effort, we can use this data to inform efforts to advance the latest best practices and policies for injury prevention in Massachusetts and to improve the quality and length of life for many citizens each year.

Massachusetts Injury Prevention Activities

Through its collaborations with internal and external partners, the MDPH Injury Prevention and Control Program promotes unintentional injury prevention policies and programs in a number of key areas, some of which are described below. The current MDPH Strategic Plan for the Prevention of Unintentional Injury can be found at: **http://www.mass.gov/eohhs/docs/dph/injury-surveillance/strategic-plan-2012-2016.pdf.**

Falls Among Older Adults

MDPH strategies to prevent falls among older adults include supporting prevention infrastructure and stakeholders through the MA Falls Prevention Coalition; prioritizing falls prevention for Prevention and Wellness Trust Fund grantees; promoting community-based programs to improve strength and balance; promoting fall risk assessments by primary care providers; developing and disseminating educational materials; convening the MA Commission on Falls Prevention to draft policy and programming recommendations; and improving Massachusetts data on fall injuries.

Poisoning/Overdoses

A growing number of poisoning/overdoses in MA are caused by opioid-related drugs. In February 2015, Governor Baker established an Opioid Addiction Working Group to gather information from communities and develop a statewide strategy to combat opioid addiction. DPH strategies to prevent opioid overdoses include funding community prevention coalitions, the Parent Power educational campaign, expanding the availability of Naloxone (to reverse opioid overdoses) and requiring prescribers to use the Prescription Monitoring Program for initial opioid prescriptions. DPH also helps fund the Regional Center for Poison Control and Prevention, which, in addition to treatment assistance, provides education and outreach to prevent poisoning.

Massachusetts Injury Prevention Activities (cont.)

Motor Vehicle Crashes

Occupant protection is a priority area of the MDPH's Strategic Plan for Unintentional Injury Prevention. Specific strategies include supporting prevention infrastructure and stakeholders through the Traffic Safety Coalition of Massachusetts, a coalition of transportation safety advocates from across the state; disseminating relevant state data, research findings and evidence-based strategies to prevention partners; participating in the planning and implementation of the MA Strategic Highway Safety Plan (SHSP); partnering with the Massachusetts Department of Transportation/Registry of Motor Vehicles (MassDOT/RMV) to improve implementation of the Junior Operators License (JOL) law; and developing a Safe Driving Policy for MDPH employees.

Child Drowning

The Massachusetts State Child Fatality Review Team considers drowning prevention a key focus area of preventable deaths. As a result of drowning fatality reviews by this team, MDPH promotes a range of specific prevention strategies to the public and key stakeholders, including continuous supervision of children while in or near water, swimming lessons for all children, child-proof barriers for all backyard pools, use of personal flotation devices by children in boats, and learning CPR and other steps to take in the event of a possible or near-drowning.

Youth Sports Concussions

Following passage of sports concussions legislation in 2010, MDPH worked with key stakeholders to ensure that these injuries are identified and managed appropriately among students at MA middle and high schools. MDPH has developed regulations requiring standardized procedures for students, coaches, school staff, parents and medical professionals on prevention, training, management and return to activity decisions, and is actively implementing these policies within MA middle and high schools.

Resources

For further information about injury prevention efforts in Massachusetts, contact:

Injury Prevention and Control Program (IPCP)
Massachusetts Department of Public Health
250 Washington Street, 4th Floor
Boston, MA 02108
(617) 624-5413
www.mass.gov/dph/injury

This report and other MA injury data are available on-line at the Injury Surveillance Program website. Custom data analysis can also be requested by contacting the Injury Surveillance Program directly at:

Injury Surveillance Program (ISP)
Massachusetts Department of Public Health
250 Washington Street, 4th Floor
Boston, MA 02108
Phone: (617) 624-5648 ; e-mail: MDPH-ISP@state.ma.us
www.mass.gov/dph/isp

Data Sources and Notes

Deaths: Registry of Vital Records and Statistics (RVRS), MA Department of Public Health (MDPH). Includes MA residents who died in or out-of-state; non-MA residents are excluded. Deaths are compiled and reported by calendar year.

Nonfatal Injuries and Hospital Charges: MA Inpatient Hospital Discharge, Outpatient Observation Stay and Emergency Department Discharge databases, MA Center for Health Information and Analysis. These databases are compiled and reported by fiscal year (Oct. 2011 – Sept. 2012). Data do not include non-MA residents or MA residents who received care out-of-state.

Population: Annual Estimates of the Resident U.S. Population by Single Year of Age and Sex: April 1, 2010 to July 1, 2012, U.S. Census Bureau (Released June 2013).

Counts and Rates: Due to confidentiality guidelines, counts and rates based on less than 11 nonfatal injuries are suppressed. Rates based on counts of less than 20 may be unstable and should be interpreted with caution; rates are not calculated on counts of less than 5 deaths. All rates are age-adjusted rates per 100,000 MA residents unless otherwise noted. Tables by age group (tables 5-9) use age-specific rates.

Injury Definitions

MDPH recently modified its injury definitions to align more closely with national standards. Therefore data from this report should not be compared with previous injury reports or the MA Registry of Vital Records and Statistics Death Report 2012.

Injury Deaths: Injury deaths are defined as those with an ICD-10 code of V01-Y36, Y85-Y87, Y89 or U01-U03 in the underlying cause of death field. Adverse medical/surgical effects and late entry deaths are excluded.[1]

Injury-related Hospital Stays: Hospital stays include hospital discharges and observation stays; in-hospital deaths and transfers are excluded. Injury cases are defined as those with an ICD-9-CM code of 800-909.2, 909.4, 909.9, 910-994.9, 995.5-995.59 or 995.80-995.85 in *any* diagnosis field. Adverse medical/surgical effects are excluded.[1] In contrast with CDC guidelines, the MA injury definition searches all diagnosis fields for these codes, rather than just the principal diagnosis field.

Injury-related Emergency Department (ED) Visits: Injury cases in ED data are defined as those with an ICD-9-CM code of 800-909.2, 909.4, 909.9, 910-994.9, 995.5-995.59 or 995.80-995.85 in the *principal* diagnosis field, (which excludes adverse medical/surgical effects), OR an external-cause-of-injury (E-code) of E800-E869, E880-E929, or E950-E999 in *any* diagnosis field.[1] Deaths are excluded.

Injury Cause and Intent: Injury deaths are classified according to CDC guidelines using ICD-10 underlying cause of death codes.[2] Nonfatal injuries are classified by cause and intent according to CDC guidelines using the first valid ICD-9-CM E-code.[3]

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1. Thomas KE, Johnson RL. *State injury indicator report: Instructions for preparing 2011 data.* Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2013.
2. See ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/injury/sascodes/icd10_external.xls
3. See http://www.cdc.gov/injury/wisqars/ecode_matrix.html

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